

***INCIDENCE OF WORM INFECTION IN PRIMARY SCHOOL CHILDREN IN THE
NEW NORMAL IMPLEMENTATION OF PANDEMI COVID-19 IN THE COASTAL
AREA OF NORTH SULAWESI***

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ABSTRACT

The impact experienced by children due to the corona virus pandemic is that children have to undergo the learning process at home because the government closes schools to minimize the spread of covid-19. The new normal is a new way of life in carrying out life activities amid the unfinished Covid-19 pandemic. The new normal is needed to keep us safe from infection with viruses and other pathogens so that it keeps us from getting sick. One of the habits in implementing the new normal is the application of Clean and Healthy Behavior (PHBS). One of the infectious diseases that are closely related to the application of PHBS is worm infection. Worm infections contribute to other health problems such as diarrhea, malnutrition and anemia. Malnutrition can inhibit physical and intellectual development in children during their infancy and reduce endurance. The aim of this study was to determine the prevalence of intestinal nematode infection through several examination methods; to determine the relationship between nutritional status and PHBS with nematode infection. This research was conducted at GMIM Wori Elementary School with a total sample of 23 students. The examination method used is the native method and the Baerman test method. The results showed 45% of respondents were infected with worms through the native method examination and 5% of respondents were infected with larvae of *Strongyloides stercoralis* through the Baerman test method. There is no relationship between worm infection with nutritional status and PHBS.

Keywords : Worm infection; Primary school children; Coastal area; New normal.

INTRODUCTION

Children are a group vulnerable to viral infections. The number of cases of corona virus infection in children is rarely found. If there is positive confirmation of covid-19 infection in the child if it is acquired or transmitted by other family members. The clinical manifestations of children who are confirmed positive for Covid-19 are asymptomatic, mild or moderate illness. Children who experience severe and critical illness are experienced comorbid children with a small presentation. Several theories that explain the reasons why children have better immunity than adults are that children have higher antibody levels than adults. Another reason is that the SARS-CoV-2 binding protein is immature [1].

Another impact experienced by children due to the corona virus pandemic is that children have to undergo the learning process at home because the government closes schools to minimize the spread of covid-19. Online learning (online) has been taking place since the outbreak of the Covid-19 case. The government through the Ministry of Education and Culture has decided that online learning starts from May to December 2020 for schools that are in the red zone while schools in the green zone can adjust to the situation.

Over time, the Government announced the adoption of the "new normal (*New Normal*)". The new normal is a new way of life in carrying out life activities amid the unfinished Covid-19 pandemic. The new normal is needed to keep us safe against viral infections and other pathogens, thus keeping us from getting sick. One of the habits in implementing the new normal is the application of Clean and Healthy Living Behaviors (PHBS) [2].

Worms infection can be experienced by all age groups, but the incidence prevalence in children is higher than in adults. Children are a developmental stage that is quite susceptible to various diseases because of their immune system. Worm infection can cause various other diseases including diarrhea, anemia, malnutrition and growth disorders. Worms infection is closely related to lifestyle and sanitation. Research conducted by

Setyowatiningsih and Surati (2017) shows that improvements in hygiene reduce one hundred percent of the prevalence of worm infections [3].

Intestinal worm infection can affect the immune status or immunity of the sufferer because it can increase the body's immune cells. Research conducted by Mutiara H *et al* (2019) shows that there is a relationship between STH infection and an increase in the number of eosinophils [4].

METHODS

This type of research will be conducted using a *cross-sectional* study design. Container / pot of feces were distributed to the students with the technical explanations given collection of stool, using a container made of consumables. Stool collection is sterile and disposable; The lid of the container used is the one that fits the feces container and is tight. The spatula can be separate or attached to the lid of the stool collection container. The label on the stool collector includes a specific sample identification number, name of sample owner and time of collection. Clean paper is given to collect feces and a plastic bag as a storage place for the feces collection container.

Explained to the parents about the reasons why stool is needed in the study. It explained the materials to be used, namely a container for feces, a spatula and a plastic bag. Emphasized to the parents of research subjects the importance of using a fecal container only for their own children's feces and ensuring that the parents put their child's stool sample in a stool container that has been labeled with the child's name and identification number. Explained to parents of research subjects to follow the instructions how to collect feces. The stool is examined in the laboratory within 24 hours after the stool is received. Record the time of receipt of stool samples.

Materials and tools needed for the examination of native methods are a stool specimen, NaCl 0,9 % and 2% eosin solution. The tools needed are a microscope, object glass, stick / stick, tissue, dropper, *cover glass*. In drops 1 drop of 0.9% NaCl / eosin solution of 2% on the slide are clean and dry. With an applicator / stick, take a small amount of stool (± 2 mg) and mix it in a drop of faal / eosin salt to form a homogeneous suspension. Remove any rough parts . Place the deck glass on top of the suspension. Try not to form any air bubbles. Examine under a microscope using a low-power objective (10x), then systematically examine the entire surface area of the deck glass for parasites. If any suspicious objects are found, examine them objectively 40x.

The tool used is a modification tool Baerman test is made of the funnel , s aringan of wire , a welding gauze , s tan , k glue , l idi , l ampu table and s hawk rubber ; s entrifuge ; t plastic tube . The materials used are feces and distilled water. The funnel is filled with distilled water so that it can't be accommodated at the clamp boundary. Tinja an amount of ± 5 grams is placed on gauze and covered and allowed to soak . B agian plastic hose clamp toward irradiated with light and b iarkan for ± 2 hours . A ir accommodated in a tube and centrifuged at a speed of 2,500 rpm for 5 minutes and then a ir in vitro shed quickly and left in a tube placed above objects glas and examined under a microscope.

The sample collection procedure is socialized to accompanying teachers, parents and students then sample containers are distributed. Students were asked to fill out a questionnaire containing life behaviors related to worm infection in the presence of their parents. Measurement of weight and height of students was carried out to obtain data on the nutritional status of students. Sampling was carried out for three consecutive days after the sample containers were distributed by giving *rewards* in the form of healthy snacks for students who collected samples.

The analysis was carried out descriptively and statistically. Descriptive analysis was used to determine the frequency distribution of the bound measurement results . Statistical analysis was used to analyze the relationship using the Chi-Square statistical test. This research was carried out based on research ethics recommendations issued by the Health Research Ethics Commission of the Poltekkes Kemenkes Manado No.KEPK.01/03/009/2020.

RESULTS AND DISCUSSION

Sample collection was carried out during the COVID-19 pandemic so that the socialization procedure and sample collection from respondents could not be carried out simultaneously for all respondents due to the

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application of health protocols, namely maintaining distance. This also resulted in the number of respondents participating in the research not being maximized.

Table 1. Characteristics of nutritional status and demographics of SD GMIM Wori SD respondents

Variable	N (%)	Variable	N (%)
type sex		Finger sucking habit	
Male	15 (75)	Yes	5 (25)
Women	5 (25)	No	15 (75)
Nutritional Status		Finger nail hygiene	
Skinny	1 (5)	Yes	11 (55)
Normal	17 (85)	No	9 (45)
Grease	1 (5)	Income people older	
Obesity	1 (5)	>/=Regional minimum wage	3 (15)
Using footwear		< Regonal minimum wage	17 (85)
Yes	14 (70)	Work the elderly	
No	6 (30)	Civil servant	1 (5)
Wash hands with soap		Trader	5 (25)
Yes	20 (100)	Farmer	3 (15)
No	0 (0)	Fisherman	2 (10)
Soil playing habits		Odd jobs	9 (45)
Yes	12 (60)	The area where live	
No	8 (40)	Beach	14 (70)
Defecation place		Plains	4 (20)
Latrine	19 (95)	River	1 (5)
Outside the latrine	1 (5)	Mountains	1 (5)
Wash hands after defecating			
Yes	8 (40)		
No	12 (60)		

The number of samples returned by students was not the same as the sample containers that were distributed. The total number of respondents who participated in the dissemination and distribution of the sample container is a total of 37 people, but that returns the container containing the sample is as much as 23 people . In addition, there were some samples that could not be examined because they did not meet the criteria so that the final number of samples examined was 20 samples. The samples collected were examined in the Parasitology laboratory, Medical Laboratory Technology Department. The questionnaire and examination results are presented in tabular form.

Table 2. The results of examination of the stool samples of respondents at SD GMIM Wori

Examination Results	n	%
Native Method		
Positive	9	45
Negative	11	55
Total	20	100
Baerman test method		
Positive	1	5
Negative	19	95
Total	20	100

The sampling location was SD GMIM Wori, Wori District, North Minahasa Regency. The incidence of worm infections in school children is 45 % (9 people) of the 20 sample respondents who meet the criteria for examination. This figure is relatively higher than the STH infection research conducted by Annisa *et al* (2018) at 27.1% and Lalangpuling (2020) by 4% [5][6].

The high incidence rate can be caused by the inadequate implementation of PHBS and the implementation of the worming distribution program for school children that has not been implemented due to the COVID-10 pandemic conditions. Research conducted by Masniati *et al* (2018) shows that there is a statistically significant effect on the results of the STH class worm disease examination [7].

Respondents aged six to thirteen years who are able to carry out daily activities independently without help from other people. This causes respondents to adopt clean and healthy living habits independently or not. Research conducted by Pan (2019) revealed that 96,4 % of respondents infected with *Ascaris lumbricoides*. This shows that the presentation of worm infections is greater in school age children compared to toddlers [8].

Respondents who participated in the study did not take deworming medication in the last three months because there was a reinfection process. *A. lubricoides* took two months for pushing to produce eggs since ingested, *T. trichiura* take three months and *hookworm* takes thirty- five days. The collected stool is not contaminated by urine and water to maintain the consistency of the stool. In addition, the urea in the urine can damage the egg walls of the worms, resulting in a false negative test result; and prevent water-borne contamination of worm eggs that could result in false positive results.

The application of Clean and Healthy Living Behavior (PHBS) is closely related to worm infection, so it is important to analyze the relationship between worm infection and PHBS. The PHBS of the respondents analyzed included using footwear, playing with the ground, the location of defecating, washing hands after defecating, finger sucking and nail hygiene.

A total of 30% of respondents who are positive for worm infection have the habit of not using footwear. Hookworm species (*hookworm*) has a cycle of infection by penetration into the human body through the skin, especially the feet. In sandy soil is fertile, humus mixed and protected from direct sun, hookworm eggs hatch into larvae rhabditiform within 24-36 hours at the optimum temperature (*N. Americanus*: 28⁰ - 32⁰ C and *A. duodenale*: 23⁰ - 25⁰ C) then develop into infective filariform on day 5 - 8. Filariform larvae can survive 7 - 8 weeks in soil and must penetrate human skin to continue their life cycle. Larvae penetrate the blood capillaries and participate in circulation to the right heart. Then migrate to the lungs, through the bronchi and into the trachea, then into the larynx and into the small intestine. The worms develop into adults and can produce 9000 - 10,000 eggs every day [9].

Table 3. Relationship between worm infection on native examination with PHBS of SD GMIM Wori respondents

PHBS	Infection		Total	P
	Positive (n /%)	Negative (n /%)		
Using footwear				
Yes	8 (40)	6 (30)	14	0.095
Not	1 (5)	5 (25)	6	
Playing land				
Yes	5 (25)	7 (35)	12	0.714
Not	4 (20)	4 (20)	8	
BAB place				
Toilet	9 (45)	0 (0)	9	0,000 *
Outside the latrine	0 (0)	11 (55)	11	
Wash hands after defecating				
Yes	4 (20)	4 (20)	8	0.714
Not	5 (25)	7 (35)	12	
Finger sucking				
Yes	2 (10)	3 (15)	5	0.795
Not	7 (35)	8 (40)	15	
Nail hygiene				
Yes	6 (30)	5 (25)	11	0.343
Not	3 (15)	6 (30)	9	

* Significant if p value < 0.050

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The habit of playing with the soil, sucking on the fingers, clean nails and the habit of washing hands after defecating are also closely related to worm infections. As many as 60% of respondents who have a habit of playing with the earth are infected with worms, 20% of respondents who have a habit of sucking their fingers have worm infections and 45% of respondents who are infected with worms do not pay attention to nail hygiene. Research conducted by Dewi and Laksmi (2017) shows that there is a significant relationship between STH infection with hand washing and soil contact. Research conducted by Wahyuni, D (2016) shows that there is a relationship between the habit of cutting nails and STH infection. Respondents have a habit of defecating in the latrine (95%), but all of them have STH infection. This is caused by the application of PHBs responde n which do not meet the standards [10].

Table 5. Relationship between worm infection on native examination and nutritional status of respondents at SD GMIM Wori

Worm infection	Nutritional Status					p
	Skinny N (%)	Normal N (%)	Fat N (%)	Obesity N (%)	Total N(%)	
Positive	0 (0)	8 (40)	0 (0)	1 (5)	9 (45)	0.409
Negative	1 (5)	9 (45)	1 (5)	0 (0)	11 (55)	
Total	1 (5)	17 (85)	1 (5)	1 (5)	20 (100)	

Data nutritional status of respondents involved in this study were obtained from through measurement of weight and height . Determination of the nutritional status of children based on the processing of data using application *Exel* determination of nutritional status using anthropometric standards Kepmenkes No. 1995 / Minister of Health / sk / xl 1 / 2010. Measurement index based on Body Mass Index (BMI) according to age (BMI / U) for measuring the nutritional status of children aged 5-18 years is divided into four categories, namely: very thin (Z-score <-3 SD), thin (-3 SD to with <-2 SD), normal (-2 SD to 1 SD), obese (> 1 SD to 2 SD) and obese (> 2 SD). From the results of laboratory examinations shows [11].

CONCLUSION

The results showed that the prevalence of intestinal nematode infection through native examination was 45 % and *Baerman's test* was 5 % . There is no relationship between nutritional status and there is no relationship between Clean and Healthy Behavior (PHBS) and worm infections in school children.

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